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turning to Correns, I made the plant with much confidence *Dicranum montanum*; comparison with herbarium specimens confirmed the determination.

The second case was that of sterile *Encalypta contorta*. I had determined the plant, but wanted assurance. Correns, page 98, promptly furnished it, picturing the brittle, brown, thread-like, "*Brutkoerper*" found so abundantly on this plant.

Corren's notable work will aid students in the determination of many sterile mosses.

WINONA, MINN.

HYMENOSTOMUM IN NORTH AMERICA

A. LEROY ANDREWS

1. Delimitation of the genus

Amongst many uncertainties in a perplexing group of moss forms, one fact is too clear to deserve to be obscured by unjustified taxonomic partitions: namely the close natural relationship of many species which have hitherto usually been divided among the genera *Astomum*, *Hymenostomum* and *Weisia*. As represented in the north temperate zone, where their types belong, practically all of their species show gametophytes with no essential difference and only a series of sporophytes representing such a close gradation of forms that not only are the species still debatable, but the genera are in each case connected by forms which can with about equal justice be placed in either genus. This is particularly true in Europe, whose moss-flora has been most intensively studied. The species generally known as *Hymenostomum rostellatum* (Brid.) Schimp. is as good an *Astomum* as an *Hymenostomum*¹ and its recent revival as a separate genus *Kleioweissia*² Bayr-hoffer, 1849, by Loeske³ would make matters worse rather than better. The case is not greatly different with the species of the tropics and the southern hemisphere. On what grounds Brotherus⁴ includes with *Hymenostomum* as distinct from *Astomum* the minute species *H. abbreviatum* (Thw. & Mitt.) Broth. from Ceylon and *H. subacaule* (Mitt.) Broth. from Ecuador⁵ is not readily evident.⁶ Before finishing his work he had apparently forgotten having thus disposed of

¹Cf. Limpricht in Rabenhorst, Kryptogamenflora, IV, I, 224. 1886.

²The above is the original spelling.

³Studien, 76. 1910. Bayr-hoffer, Übersicht der Moose, Lebermoose und Flechten des Taunus, 3. 1849; Bayr-hoffer seems to have taken the name from Bryologia Europaea.

⁴Engler & Prantl, Natürliche Pflanzenfamilien, I, III, 386. 1902.

⁵Mitten (Journ. Linn. Soc., Bot., XII, 131. 1869) had recorded it from Bolivia as well as Ecuador.

⁶The combination *H. subacaule* seems to go back to Paris, Index Bryologicus, 596 (1895), though not so credited by Brotherus. The other combination *H. abbreviatum* is on the other hand accepted by Paris in his second edition, II, 356 (1904) after he had included the species with *Systegium* (= *Astomum*) in his first edition, 1258 (1897). The combination *Astomum subacaule* was made by Jaeger, Musci Cleistocarpi, 13 (1869).

the former, for it appears again⁷ as *Astomum abbreviatum* (Mitt.) Fleisch. from Java. Fleischer⁸ did not however report it from Java, but included it as to be expected in Java on the basis of its occurrence in Ceylon, outside of which island it has not, so far as I know, been found. I note also a species, *Astomum chilense*, recently described by Williams⁹ which is so close to *Phascum recurvirostrum* C. M.¹⁰ from Paraguay placed by Paris in *Hymenostomum* that even its specific validity is questionable, as Mr. Williams was inclined to admit when I called his attention to the other species. Roth had transferred this species to *Astomum* and figured it.¹¹ It should be added that Brotherus has not included it at all and that Paris¹² apparently incorrectly represents it as identical with *Hymenostomum Balansaeanum* Besch. The confusion is doubtless due to the fact that both were collected by Balansa. *H. Balansaeanum* is understood to be one of the more highly developed gymnostomous so-called Hymenostomums and has recently been figured as such by Felippone from new material collected by himself and evidently determined by Brotherus.¹³ It may be noted in passing that *A. recurvirostrum* and *A. chilense* together with some other South American Astomums differ considerably in gametophyte characters from the uniform type of the Astomums of the northern hemisphere and are perhaps best regarded as cleistocarpous forms more immediately related to so-called Hymenostomums and Trichostomums of their general region. The case as between *Hymenostomum* and *Weisia* is perhaps not quite so bad, but European bryologists speak of the difficulty of separating *Weisia crispata* (N. & H.) C. M. and *Hymenostomum tortile* (Schwaegr.) B. & S.¹⁴ Certainly there is no sharp generic division even with these last two species excluded from consideration. They are themselves in something of a "twilight zone" toward *Trichostomum*.

On the other hand there are some mosses, especially from the tropics, commonly included with *Hymenostomum* (so also by Brotherus) which are not directly related to *Weisia*-species, but form the gymnostomous relatives of species ordinarily placed in *Trichostomum* Hedw., as is being more and more recognized.¹⁵ In a natural grouping these should then either be excluded from *Hymenostomum* or the genus should be extended to cover at least some of the species now assigned to *Trichostomum*. The hybridization of *Trichostomum flavovirens* Bruch with *Astomum crispum* (Hedw.) Hampe detected by Nicholson¹⁶ shows a close relationship which might more or less justify the drawing of the broader generic lines last suggested, which would further involve the inclusion of *Tortella* (C. M.) Limpr. It is not however my intention to carry the discussion further in this

⁷Op. cit. (Nachträge), 1189. 1909.

⁸Flore de Buitenzorg, V, I, 315. 1902.

⁹Bull. Torrey Bot. Club, XLII, 393. 1915.

¹⁰Flora, LXXI, 5. 1888.

¹¹Auszereuropäisch Laubmoose, I, 195. 1911.

¹²Index Bryologicus, ed. 2, II, 356. 1904.

¹³Contribution à la Flore Bryologique de l'Uruguay, I, 17. 1909.

¹⁴Cf. Dixon, Handbook, ed. 2, 230. 1904; Limpricht in Rabenhorst, Kryptogamenflora, IV, I, 230. 254. 1886.

¹⁵Cf. Fleischer, Flore de Buitenzorg, V, I, 313. 1902.

¹⁶Rev. Bryol., XXXVII, 23f. 1910.

direction. For the present I shall exclude from *Hymenostomum* the several tropical North American species which have been assigned to it. It is of course well known that Lindberg¹⁷ proposed a synthetic genus covering all the above and others under the name of *Mollia* Schrank,¹⁸ which has been followed by a number of authors, notably Braithwaite¹⁹ and (with the separation of *Trichostomum* including *Tortella*) under the name of *Weisia* by Dixon,²⁰ though the latter in his later studies in exotic mosses seems to have broken with his earlier system.²¹ There is something to be said in favor of Lindberg's genus, but perhaps less in favor of its name.²² At any rate it does not apply to the more limited group which I have included under *Hymenostomum*. Some of the groups within Lindberg's genus are not however, connected by close transitional forms and their separation as genera seemingly abundantly justified. It may be noted that Lindberg's subgenus *Hymenostomum* of his genus *Mollia*²³ corresponds exactly with the genus *Hymenostomum* as I have delimited it.

A further case of unnatural synthesis is found in the inclusion by Brotherus²⁴ of the genus *Tetrapterum* Hampe consisting of a species each from South Africa and Australia with *Astomum*. Jaeger in his treatment of the cleistocarpous mosses²⁵ regarded the two species as cleistocarpous relatives of *Hyophila* Brid. They suggest to me rather relatives of species of the *Trichostomum* type and not too closely related to each other. A would-be natural system that separates generically even European *Astomum* and *Hymenostomum* can certainly not with any claim to naturalness include *Tetrapterum* with *Astomum*.

As to the valid name of the genus as we have delimited it, *Weisia* or *Veisia* Hedw., 1782²⁶ is antedated by *Weissia* Ehrh., 1779²⁷ and must accordingly be dropped. The next available is *Hymenostomum* R. Br., 1819,²⁸ which also has the merit not possessed by the later *Astomum* Hampe, 1837²⁹ that there is no question as to its type-species, it having been proposed as monotypic (for *Gymnostomum microstomum* Hedw.). The question of the appropriateness of the name for all species may be raised, but is not validly pertinent. In the necessary transition from the old artificial grouping to something that is intended to express natural relationship it is inevitable that generic names originally descriptive should cease to be distinctively so, nor is there any occasion to worry unduly over the matter. We do not require all Smiths to be workers in metals or else

¹⁷Utkast till en naturlig gruppering, 29f. 1878.

¹⁸Baier. Flora, II, 455. 1789.

¹⁹British Moss Flora, I, 228ff. 1887.

²⁰Handbook of British Mosses, 203ff. 1896; ed. 2, 223ff. 1904.

²¹Cf. e. g. Journ. Linn. Soc., Bot., XLIII, 307. 1916: *Gyroweisia*.

²²This question is discussed at length by LeJolis, Rev. Bryol., XXII, 19ff. 1895.

²³Musci Scand., 21. 1879.

²⁴Op. cit., 384f.

²⁵Musci Cleistocarpi, 26f. 1869.

²⁶Fundamentum, II, 83: *Weisia*; 90: *Veisia*.

²⁷Hannoversches Magazin, XVII, 1003.

²⁸Trans Linn Soc., XII, 573.

²⁹Flora, XX, 285.

change their name. Schimper was guilty of some strange alterations of name on this reasoning, in our group for example substituting for *Astomum Systegium*,³⁰ a name which has also been employed by Mitten and others. It has even lived through the second edition of Paris' Index as the accepted name of the genus. Such a substitute name has of course no validity over the prior name for which it is arbitrarily substituted, though it may be noted in this particular case that *Astomum* had when the substitution was made ceased to be a heterogeneous group, while the original *Astomum* of Hampe was a conglomerate of cleistocarpous forms, the first of which, *A. rostratum*, is unidentifiable³¹ and only the second, *A. crispum* belongs to the genus as afterwards understood. Even in the sense in which it is at present generally applied *Hymenostomum* has little appropriateness. An hymenium plays no rôle in the European *H. rostellatum* and one is hardly present in the European *H. tortile*,³² nor in most of the tropical so-called Hymenostomums,³³ which are gymnostomous, not hymenostomous, and were in fact formerly included in the wholly artificial and heterogeneous genus *Gymnostomum*, as was for that matter *H. microstomum* itself. The hymenium of this group is hardly a structure of phylogenetic importance.

The genus thus delimited and named would naturally be divided into three subgenera: *Astomum*, *Euhymenostomum* and *Weisia*, and as these are clearly enough distinguished in our North American species their exact dividing lines need not be further discussed. *Astomum* is normally cleistocarpous, *Euhymenostomum* is normally hymenostomous, *Weisia* is normally peristomate.

ITHACA, N. Y.

REVIEW

Contributions (Beitraege) to the Mossflora of Java, the Strait Settlement and Burma, by Hjalmar Moeller

(IN HEDWIGIA, BAND LX, 1919, PP. 313-330)

This is a list of 206 species of mosses, including descriptions of the following new species:

Rhizogonium salakanum Moeller,

Stereophyllum Moelleri Broth.,

Ectropothecium ichnotocladum (C. M.) Jaeg. var. *filivaneum* Broth.,

Xanthocladium scabrifolium Broth.

All four plants are figured.

³⁰Syn., 30. 1860.

³¹It is generally assumed to be *A. rostellatum*.

³²Limpricht (Op. cit., 229f.) says that it is ruptured before the operculum is removed and questions (224) the validity of the inclusion of this species in the genus.

³³Cf. Fleischer, Op. cit., 313.